COMP 3350 Homework #1

Possible points: 100 Due: February 8, 2019 4:59pm

The goal of this assignment is to get you familiar with data representation and simple logic operations. To get full credit, please show your work (where needed) for each problem. Submit a word doc or pdf, computer typed only; I will not accept any handwritten or scanned homework. No homework will be accepted after the due date, so make sure to start early.

1. Convert the following unsigned base2 numbers (binary) to base 16 numbers (hexadecimal):
   A. 0110 0001 1111
   B. 1000 1111 1100
   C. 0001 0110 0100 0101

2. Convert the following signed base 2 numbers (binary) to base 10 numbers (decimal):
   A. 1100 1010
   B. 1111 0010
   C. 1000 0111

   Each using :
   a) Signed_magnitude representation.
   b) One's complement representation.
   c) Two's complement representation.

3. Convert the following base 10 (decimal) values to two's complement (8-bits) :
   A. -100d
   B. -16d
   C. -21d
   D. -0d

   Each using :
   a) Signed_magnitude representation.
   b) One's complement representation.
   c) Two's complement representation.

4. What is the range of:
   A. An unsigned 7-bit number ?
   B. A signed 7-bit number ?

5. Provide the answer to the following problems ($\wedge$ = AND, $\vee$ = OR)
   A. 1000 $\wedge$ 1110
   B. 1000 $\vee$ 1110
   C. (1000 $\wedge$ 1110) $\vee$ (1001 $\wedge$ 1110)

6. Find the hexadecimal ASCII values for the following characters:

A. g
B. ^
C. $

7. Please demonstrate each step in the calculation of the arithmetic operation 25 - 65. (both 25 and 65 are signed decimal numbers)